should not work for 10 to 14 days after symptoms begin. The attendent loss of income and the disruption of the practice can usually be prevented by routine care during eye examination.

We know adenovirus can cause keratoconjunctivitis. We can quickly identify it by direct immunofluorescent staining of conjunctival cells, and we can frequently prevent its spread. We are now awaiting the development of a specific antiadenovirus agent.

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HLA Antigens and Glaucoma

THE HISTOCOMPATIBILITY (HLA) SYSTEM is of immediate interest and relevance to many workers in ophthalmology. Research in this area is in an extremely active phase. Data are being collected and new information is becoming known; however, one has to be prepared for changes in views and ideas as a result of improved methods and investigations.

Associations between HLA antigens and a particular disease are characterized by relative increases in the frequency of particular antigens in the group of diseased patients as compared with racially and ethnically matched control groups. Thus, control is important as the normal frequency of certain HLA types varies considerably in various parts of the world. For example, HLA-B5 is found in 34 percent of Japanese and only 4 percent of Africans; HLA-B8 is found in 25 percent of British and 1 percent of Japanese control subjects.

Both ankylosing spondylitis and Reiter syndrome are associated with iridocyclitis and there is a statistically significant increased incidence of HLA-B27 in these systemic diseases.

Studies suggest a relationship between HLA types and recurrent corneal herpes simplex infections. Zimmerman's co-workers found that HLA-B5 was significantly increased in the group with recurrent herpes simplex virus keratitis as compared to the control group.

Inheritance of the HLA system was determined in 235 persons from 64 families with retinoblastoma and HLA antigens of 255 healthy blood donors was determined as a control group. They found an increase of HLA-BW5 antigens among the retinoblastoma patients, particularly among hereditary cases of retinoblastoma. Simultaneously, they report a decreased HLA-12 antigen frequency among both hereditary and nonhereditary retinoblastoma patients.

There is no significant deviation of any antigen which could be found in Eales disease, chorioretinitis or central serous retinopathy. However, in patients with malignant choroidal melanoma, there is a significantly higher incidence of HLA-AW32. HLA analysis in a total of 514 patients with malignant melanomas in other parts of the body failed to show any significant HLA deviation. Skepticisms are also enhanced by the fact that so far all disease-associated HLA antigens belong to the HLA-B or HLA-D locus, or both.

Aviner and co-workers reported an increased frequency of HLA-BW35 in primary open-angle glaucoma in a predominantly white patient population with a high percentage of patients of Jewish background. These authors warned that the increase was so low it might represent a chance deviation. A series of publications from Washington University in St. Louis found the frequency of B7 and B12 significantly increased in primary open-angle glaucoma.

However, Rich and associates, Dangmar and co-workers and others could show no correlation of any of the serologically studied HLA antigens with primary open-angle glaucoma.

Kass and associates from Washington University, St. Louis, enlarged their series, reviewed all their data and concluded that the associations between A and B loci of the HLA antigen system and primary open-angle glaucoma are less impressive than previously reported. At present, there is no clear-cut evidence of HLA antigens having a definite association with open-angle or angle-closure glaucoma.

In families in which there is a familial disease problem, sometimes an HLA link can be found. For example, all of the children in a family who have received their mother's HLA haplotypes will have her disease and the children that have another haplotype will be free of the disease. In this way, although a particular disease cannot be found to be linked to a particular HLA type by

general population studies, a disease can nevertheless be found to be tied in some way to the HLA complex. As the HLA story continues to unfold, we will learn more about these important antigens in ophthalmology.

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Automated Perimetry

AUTOMATED PERIMETRY, like computerized axial tomography (CAT scan), is one of the exciting newer developments from the computer age. Ophthalmologists for years have purchased numerous perimetric devices in an attempt to more efficiently evaluate visual field defects. Since 1975 we have had the opportunity at the University of California, Davis to help design and evaluate several of these automated perimeters. Our initial skepticism about automated perimetry has been replaced by genuine optimism. We are inclined to agree with Fankhauser and associates and Heijl and co-workers who found automated screening superior to conventional kinetic perimetry.

The ideal automated perimeter should offer several advantages over manual techniques and include the following features: (1) precise detection and assessment of visual field defects of all types with a negligible false alarm rate, (2) accurate monitoring of progressive visual field loss, (3) standardization of stimulus conditions in test procedures, (4) electronic monitoring of eye movement, (5) reduction in examination time, (6) administration of testing procedures by persons with minimal or no perimetric training and (7) reasonable purchase price.

Unfortunately, physicians have been inundated by a variety of first generation automated perimeters. Because decisions about treatment modalities are frequently based on perimetric data, we feel it is mandatory that these perimeters be validated by controlled clinical studies to assess whether they fulfill the criteria for an ideal automated perimeter. Without such controlled published data, a physician will not be able to make an intelligent decision as to which automated perimeter is appropriate for his or her practice. This is no small decision because automated perimeters can range in price from $4,000 to $100,000.

Most automated perimeters use a static or suprathreshold static program. Some devices have kinetic programs but the versatility of static programs is becoming evident. Goldmann kinetic perimetry is the well established standard. However, it is likely that when physicians become familiar with static testing, the advantages of static and suprathreshold static perimetry may well replace kinetic programs.

In summary, the usefulness of automated perimetry is a reality. When automated perimeters are properly used and their findings validated by controlled studies, they can be excellent detectors of visual field defects. The assessment of visual field defects is somewhat limited, however, by the automated perimeters available at present. Nonetheless, as newer generations of automated perimeters are developed, it actually may be possible to see a computerized three-dimensional view of the island of vision with scotomas scooped out of the island. In the future, there may be nothing about visual fields left to the imagination.

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Lasers in Ophthalmology

HISTORICALLY, ruby lasers were the first lasers used clinically in ophthalmology. A ruby laser utilizes the photostimulation of a ruby crystal to produce coherent red light. More recently, argon lasers have gained general acceptance over other visible spectrum laser systems. This type of laser utilizes electrical stimulation or argon gas to produce a coherent green beam that is dependent